ABSTRACT OF THE DISCLOSURE

A semiconductor manufacturing process is disclosed that may form a contact structure with a tungsten plug. A contact structure hole may be adequately filled with tungsten, while avoiding plug loss, increased resistance and/or trenching, that can result from conventional approaches. According to one particular embodiment, a titanium film (**003**) may be deposited with an anisotropic sputtering method, such as an ion metal plasma method, or the like. A titanium film (**003**) may have a thickness outside a contact hole (**020**) that is 100 nm or more. However, due to anisotropic sputtering, a titanium film (**003**) within a contact hole (**020**) may be thinner than outside the contact hole (**020**). A contact hole (**020**) may then be filled with a tungsten film (**005**). A tungsten film (**005**) and titanium film (**003**) may then be etched back leaving a tungsten plug having shape with an upwardly projecting portion.

Attorney Docket No. 2004P50805US